

# DeIDOT Manuals/Publications Updates

## *DeIDOT Development Summit*

October 25, 2022



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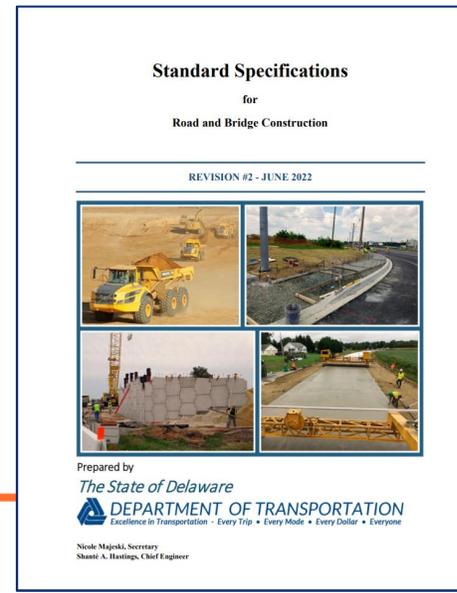
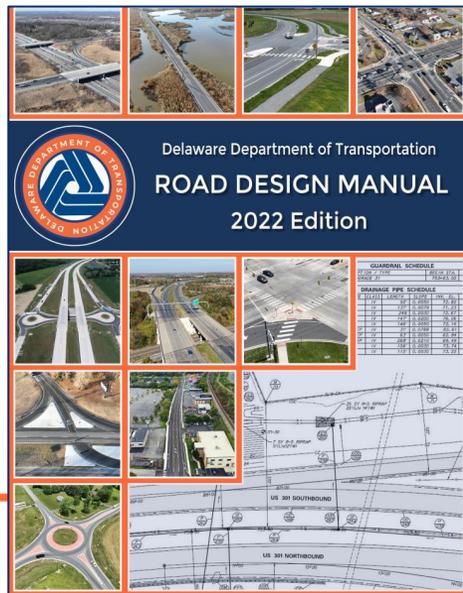




# Agenda

Provide update on the status of:

- DelDOT Road Design Manual
- DelDOT Standard Specifications
- DelDOT Standard Construction Details





# Road Design Manual (RDM)

- Status
- Philosophy
- Delaware Specific Standards
- RDM Website





# RDM Status

- Manual completed and approved for use



Recommended By:

Chief of Project Development South

Recommended By:

Chief of Project Development North

Recommended By:

Deputy Director of Design

Recommended By:

Chief Engineer

Approved By:

Cabinet Secretary

Approved for Use on all Federal Aid Projects By:

**DOUGLAS S. ATKIN** Digitally signed by DOUGLAS S. ATKIN  
Date: 2022.08.30 08:28:39 -04'00'

Division Administrator  
Federal Highway Administration



# RDM Implementation



NICOLE MAJESKI  
SECRETARY

## MEMORANDUM

**TO:** All Users of the DelDOT Road Design Manual

**FROM:** Shante Hastings, P.E. *SH*  
Deputy Secretary / Chief Engineer

**DATE:** September 22, 2022

**SUBJECT:** 2022 DelDOT Road Design Manual – Implementation

I am pleased to announce the completion and adoption of the updated 2022 DelDOT Road Design Manual (RDM) which supersedes all previous versions of the manual. The intent of this updated version of the RDM is to adopt the *AASHTO 2018 7<sup>th</sup> Edition of A Policy on Geometric Design of Highways and Streets*, and other industry recognized resource documents, to provide the design controls, criteria, and elements to be used on DelDOT transportation projects.

Certain DelDOT specific design criteria and guidance are presented in this updated version of the RDM. This version specifies whether a user should refer to other resource documents or utilize the specific DelDOT design criteria and guidance for application on DelDOT transportation projects. This version also eliminates most references to DelDOT process related material and guidance that appeared previously, resulting in a much shorter version than the previous RDM.

The previous version of the RDM has been archived and is available on the DelDOT Road Design Manual Website. It is intended that the archived RDM, in conjunction with the DelDOT Project Development Manual, the DelDOT RDM website, the DelDOT Design Resource Center, and DelDOT Design Guidance Memoranda be used as resources to provide guidance on many DelDOT design processes and practices. As industry design practices advance and new documents are published or adopted as industry best practice, these documents will be evaluated for inclusion as applicable design controls, criteria, and elements for DelDOT transportation projects and the RDM will be revised accordingly.

All Users of the Road Design Manual  
Page 2  
September 22, 2022

Upon completion of the updated RDM, it was determined that an update to the process of documenting design controls, criteria, and elements, and requesting design exceptions was required. To that end, in conjunction with the RDM update, the Design Control Checklist, the Design Criteria Form, and the Design Exception Request Form have been updated and are available of the RDM Website. Additionally, a process document was drafted to provide guidance for properly documenting design controls and criteria, and properly requesting design exceptions.

Implementation of the design controls, criteria, and elements in the updated RDM will depend on a project's status and schedule. Effective October 1, 2022, the 2022 version of the DelDOT RDM shall be adopted for use on DelDOT projects prior to the Survey Plan stage. However, all projects that have yet to advance to the Semi-Final Plan stage should be evaluated to determine if there is enough flexibility in the project's design to implement the design controls, criteria, and elements contained in the updated RDM. This evaluation should be conducted by the project team and presented to the appropriate section Chief for concurrence.

We appreciate your cooperation in implementing the updated DelDOT Road Design Manual. If there are any questions on the manual's content or proposed implementation, please contact John Caruano at [John.caruano@delaware.gov](mailto:John.caruano@delaware.gov).

SH:jcb



# RDM Philosophy

- Adopt AASHTO 2018 7<sup>th</sup> Edition of a Policy on Geometric Design of Highways and Streets (Green Book) and other industry recognized resource documents to provide the design controls, criteria, and elements to be used on DelDOT transportation projects.

## 1 Road Design Manual Introduction

### 1.1 Purpose

The Delaware Department of Transportation (DelDOT) has developed the Road Design Manual (RDM) to provide guidance and assistance in the standard practice of design of roadway features in the state of Delaware. The RDM adopts industry recognized design criteria or prescribes Delaware specific criteria for design of roadway features. Additionally, the RDM provides a general discussion of the relationship between design controls and design criteria to provide context for various design elements.



# RDM Philosophy

- Short!
  - Eliminates process related material
  - NOT a training manual
  - NOT a standalone, one-stop shop for design
  - Focus on Delaware-specific guidance
-



# RDM Table of Contents

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## 1 Road Design Manual Introduction

## 2 Design Controls and Criteria

## 3 Design Elements

## 4 Intersections

## 5 Multi-Modal Facilities

## 6 Miscellaneous



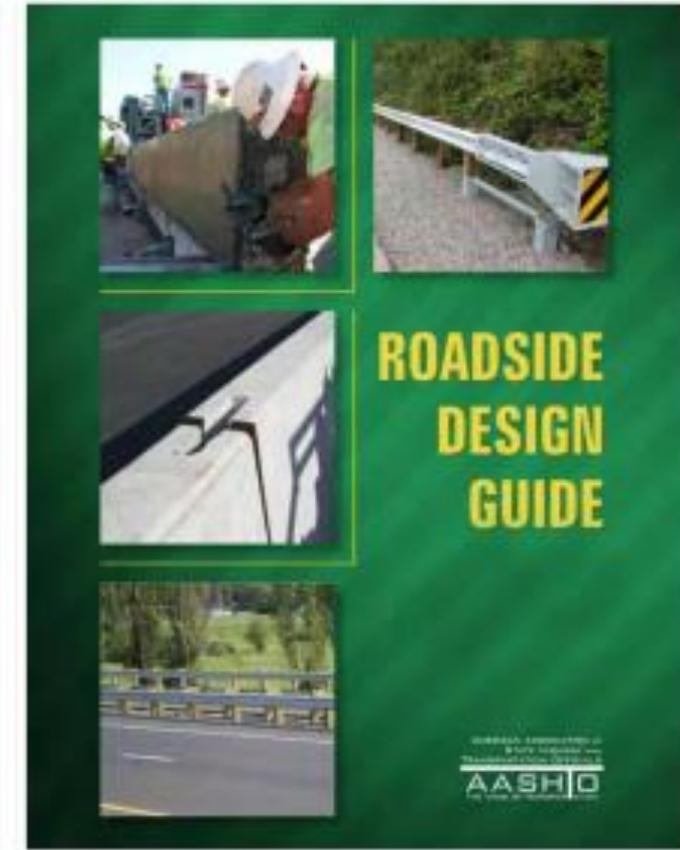
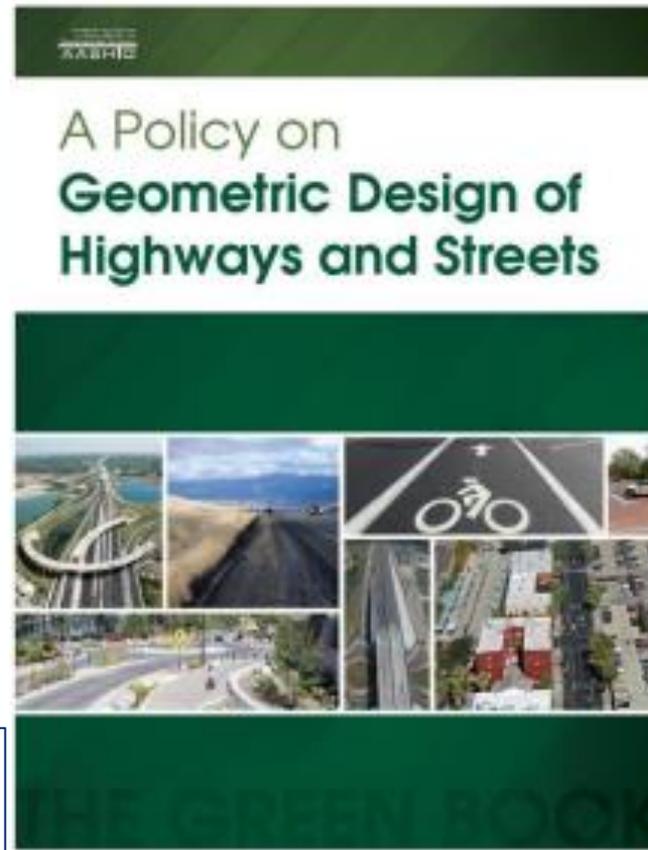
# RDM - Primary Source for Design Criteria and Elements

- Sections reference where guidance material is introduced. Users should investigate all sections of the AASHTO Green Book and the AASHTO RDG to ensure guidance material is relevant for the type of project being designed.

## 3.3.2 Sight Distance

Reference: AASHTO Green Book Section 3.2.1

Sight distance is the length of roadway ahead of the vehicle that is visible to the driver. Horizontal curvature, vertical curvature, roadside obstructions, or any combination of these elements can restrict sight distance.





# RDM - DeIDOT Specific Design Criteria/Elements

- All DeIDOT specific design criteria and guidance appearing in the RDM are presented in bold text

## 3.3.1 Horizontal Alignment, Curvature, and Superelevation

*Reference: AASHTO Green Book Sections 3.3.2, 3.3.3, 3.3.5, and 3.3.8*

Horizontal alignment of a roadway is defined graphically using a series of straight-line tangents with transition sections into and out of horizontal curves. **When developing horizontal alignments, designers should use simple curves only and avoid the use of spiral curves.**

Establishing the proper relationship between design speed and curvature, as well as their joint relationship with the proper superelevation on the curve, is an important decision. Although these relationships are derived from laws of physics (speed, centrifugal force, and side friction factor), the actual values for use in design depend on practical limits and factors determined empirically over a range of variables. For example, the maximum permissible rate of superelevation is based on a practical consideration that a high operating speed can be accommodated on a relatively sharp curve if the superelevation is steep enough. However, roadways must serve vehicles traveling at a wide range of speeds. Slow moving vehicles or stopped vehicles could be adversely affected with excessively steep superelevation, particularly in ice and snow conditions. AASHTO suggests maximum superelevation rates in the range of 4 to 12 percent. **Delaware's roadways are subject to the effects of ice and snow during the winter; therefore, DeIDOT has adopted a maximum superelevation rate of six (6) percent.**



# RDM - Delaware Specific Criteria/Elements

- Design Speed
- Level of Service
- Simple Curves
- Maximum Superelevation
- Minimum Grade
- Lane Widths
- Shoulder Widths
- Vertical Curb
- Auxiliary Lanes
- Drainage

## 2.3 Design Speed

*Reference: AASHTO Green Book Section 2.3.6*

Design speed has a greater influence on the design of a project than any other design control. To some degree, design speed impacts all elements of a project's geometric design criteria. It is important to note that design speed is a selection, and the selected design speed should be logical with respect to the characteristics of the terrain, adjacent land use, traffic volume, and functional classification of the roadway.

**Selecting a design speed equal to the anticipated posted speed upon completion of the project has become an increasingly common practice in many agencies and is the method of design speed selection for DelDOT projects.** In many cases evaluating operating speeds using speed studies is an important tool when selecting the most appropriate design speed.

## 3.4.2 Travel Lane Widths

*Reference: AASHTO Green Book Section 4.3*

The traveled way designated for vehicles normally consists of two or more travel lanes. Providing adequate lane widths maintains and/or enhances driver safety, driver comfort, level of service, and capacity.

**For new construction and reconstruction projects, 12-foot travel lanes should be used on roadways with design speeds of 55 mph, or greater and 11-foot travel lanes should be used on roadways with design speeds from 35 mph to 50 mph. Ten-foot travel lanes should be used on roadways with design speeds below 35 mph with consideration for 11-foot lanes that are adjacent to bike lanes. Ten-foot travel lanes should also be avoided along transit routes and roadways with heavy truck traffic.**



# RDM - Delaware Specific Criteria/Elements

- Retained the tables from the previous Chapter 6

**Table 6-2: Design Criteria – Allowable Spread on the Pavement Cross Section**

Functional Classification	Allowable Water Spread
Interstate, Freeways, Expressways	Full Shoulder Width
<b>Other Arterials</b>	
Arterials with full shoulder or parking lane	Full Shoulder or Parking Lane
Arterials with less than full shoulder or parking lane	½ of Adjacent Driving Lane
<b>Collectors</b>	
Design speed < 45 mph	½ of Driving Lane
Design speed ≥ 45 mph	Full Shoulder Width
Local Roads and Streets including Subdivision Streets	½ of Driving Lane
Sag Points (All facilities)	Full Shoulder Width

**Table 6-4: Design Criteria – Pipes**

Pipes	
Minimum size – cross road pipe/culvert (excluding entrance pipes and closed storm drain systems)	18 in
Minimum size – storm drain	15 in
Downstream pipe size	Must be same size or larger than upstream pipe segment
Minimum full flow velocity	3.0 ft/s



# Road Design Manual Website

<https://roaddesignmanual.deldot.gov/index.php/Home>

OR

<https://deldot.gov/Publications/>

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# Road Design Manual Website



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## Publications

### Publication Listing

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#### Brochures

- Benefits of DE1 GSI Projects
- Community Transportation Fund
- Delaware Airports & Aviation Economic Impact Assessment Brochure
- App for Real-Time Traveler Information
- Bluetooth System for Travel Time
- Connected and Automated Vehicles (CAV)
- Flood Monitoring System
- Lost Pet Information
- DelDOT Moped Brochure
- Radar Traffic Detector System
- Real Estate Advanced Acquisition Approval Process

#### Guides and Plans

- Bicycle and Pedestrian Count Program Guide
- Blueprint for a Bicycle-Friendly

- Livable Delaware Implementation Plan
- Materials and Research Manual
- Noise Policy
- On The Job Training (OJT) Program Guidelines
- Pedestrian Accessibility Standards (PAS) for Facilities in the Public Right-of-Way
- Pipe Inspection and Remediation Guide
- Professional Services Procurement Manual
- OC/OA Manual
- Road Design Manual**
- Sign Inspection Program Manual
- Standard Construction Details
- Standard Specifications
- Traffic Design Manual
- Unmanned Aircraft System Operational Policy
- Utilities Design Manual

- Financial Statement Audits
- Kent County Transportation Operations Management Plan
- New Castle County Transportation Operations Management Plan
- Sussex County Transportation Operations Management Plan
- Delaware Long Range Transportation Plan
- Delaware Long Range Transportation Plan Annual Supplement 2020
- Delaware State Aviation System Plan Update
- Delaware Strategic Highway Safety Plan (DSHSP)
- DelDOT Road Network Download Files
- Development Related Improvements Requiring New Rights-of-Way
- HOUSE RESOLUTION NO. 47: New Road Extension Feasibility Study



# Road Design Manual Website

Log in

Main page

Search Delaware DOT Road Design Manual

## Home

Welcome to the **Delaware Department of Transportation (DelDOT) Road Design Manual Website**. This site was created in conjunction with the updated **DelDOT Road Design Manual (RDM) - 2022 Edition**. It provides a location for the updated RDM and the reference documents that accompany the manual.

### Home

The "**Home**" page includes the RDM cover page as well as a link where comments or corrections may be suggested (See "Comments" section below). The "Home" page also includes instructions on navigating the RDM website as well as explaining the layout of the website and the material included on the website. It also explains the approach taken in revising the previous RDM.

### Manual

The "**Manual**" page includes a link to the updated RDM with bookmarks for each chapter. It also includes links to the updated Design Control Checklist, Design Criteria Form, Design Exception Request Form, and a newly created process document for determining design controls and criteria and requesting design exceptions.

The intent of the updated version of the DelDOT RDM is to require the use of the AASHTO *A Policy on Geometric Design of Highways and Streets* ("Green Book") and other industry recognized reference documents, such as AASHTO's *Roadside Design Guide*, to provide the design controls, criteria, and elements to be used on DelDOT transportation projects. In addition, the updated manual references DelDOT specific design criteria that when listed supersede the criteria shown in any industry recognized reference document. For emphasis the DelDOT specific criteria are shown in bold text, while the reference documents are shown in italics. (See section 3.1 for an example.)

The updated version also eliminates all references to process related material that appeared in the previous version resulting in a much shorter *Road Design Manual*. The previous version of the manual has been archived and is available on the Road Design Manual Website on the "References" page. It is intended that the archived version of the manual, in conjunction with the DelDOT *Project Development Manual*, the Road Design Manual Website, the Design Resource Center, and Design Guidance Memoranda, be used to provide guidance on many design processes and practices.

In conjunction with the update to the *Road Design Manual*, the Design Control Checklist, the Design Criteria Form, and the Design Exception Request Form have also been updated. Additionally, a document was created to provide guidance on the process of documenting design controls and criteria as well as the process of requesting a design exception. The process document also lays out the timeframes required for completion and approval of each of the forms.

Updates to the forms include a modernized format with fillable data fields, a revised Project Data section requiring project information that is uniform for all three forms, and a revised signature section with updated project titles and revised signature/approval authority. One of the most significant changes is to the Design Criteria form which has been modified to reflect the reduction in FHWA's Controlling Criteria for Design from 13 criteria to 10 criteria.

### References

The "**References**" page lists the reference documents that are included in the updated RDM as well as some other documents that may be of use including the archived version of the previous RDM. Links to access these references are provided if the reference is available and licensing fees are not required to access the material. If licensing fees are required to access select documents RDM users should be aware that many organizations possess licenses for access to this reference material.

Many sections of the *Road Design Manual* provide references to specific sections where source material is located in the "Green Book" and the *Roadside Design Guide*. (See section 2.2 for an example.) Designers should be aware that sections referenced in the manual may only represent areas of the "Green Book" and the *Roadside Design Guide* where source material is introduced. Designers should investigate all sections of the "Green Book" and *Roadside Design Guide* to ensure the referenced material is relevant for the type of project being designed.



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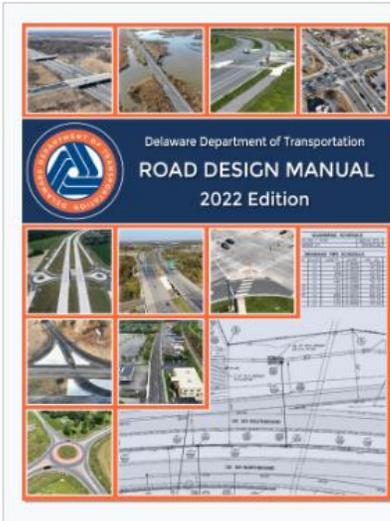
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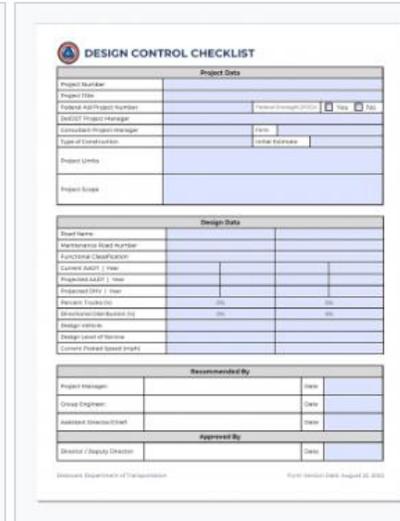
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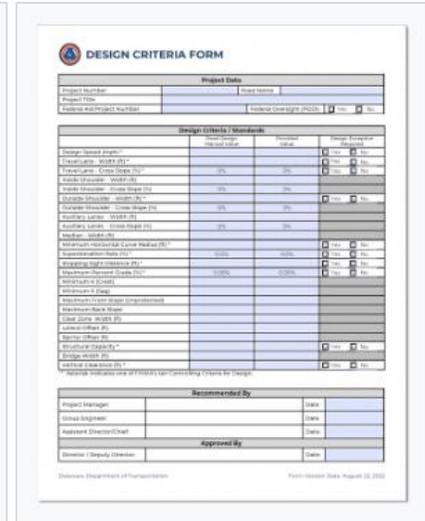
Road Design Manual Implementation Memorandum



Process for Determining and Documenting Design Control, Criteria, and Standards



Design Control Checklist



Design Criteria Form



### DESIGN EXCEPTION REQUEST FORM

Project Data	
Project Number	Auto Number <input type="checkbox"/> Yes <input type="checkbox"/> No
Project Title	
DelDOT AD/Project Number	Project Length (MILES) <input type="checkbox"/> Yes <input type="checkbox"/> No

Design Exception Request Data	
Dist Name	
Interchange Road Number	
Current Limits for Exception	
Qualifier for Design Exception	

Provide a brief summary, detailing the nature of the exception, support for the request, accident history, existing conditions, compatibility of adjacent roadway sections, etc. The design exception request shall include the design control checklist and the design criteria form with the controlling criteria for design intent.

Based upon the conditions presented, it is recommended that a design exception be approved for the individual design elements as justifies.

Recommended By	
Project Manager	Date
Design Engineer	Date
Assistant Interchange	Date

Approved By	
Assistant Director/Chief	Date
Director / Deputy Director	Date



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## References

The following documents, guidelines, and manuals have been provided here as References to the Delaware Department of Transportation (DeIDOT) Road Design Manual - 2022 Edition.

### DeIDOT References

Road Design Manual - 2004 Edition - Archived	Delaware Manual on Uniform Traffic Control Devices for Streets and Highways - 2011 Edition	Development Coordination Manual	Pedestrian Accessibility Standards Manual - 2021 Edition	Project Development Manual - 2015 Edition	Standard Construction Details	Standard Specifications	Traffic Design Manual

### AASTHO References (References May Require Downloading and/or Licensing to Access)

A Policy on Geometric Design of Highways and Streets - 2018 Edition - 7th Edition	Roadside Design Guide - 2011 - 4th Edition	Policy on Geometric Design Standards - Interstate System 2016, 6th Edition	Highway Safety Manual 2010 1st Edition	Highway Drainage Guidelines - 4th Edition	Guide for the Planning, Design, and Operation of Pedestrian Facilities - 2nd Edition	Guide for the Development of Bicycle Facilities - 2012 - 4th Edition

### FHWA References

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# RDM Supplemental Information

- Design Guidance Memorandums (In Development)
  - Design Resource Center
  - Policy Implements
  - Project Development Manual (Future Update)
  - Highway Drainage Manual (In Development)
-



# DeIDOT Standard Specifications



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## Standard Specifications

### Standard Specifications 2020

-  [Standard Specifications - Revision #2 - June 2022](#)
-  [Standard Specifications - Revision #1 - June 2021](#)
-  [Standard Specifications - Initial Publication- August 2020](#)
-  [Standard Items and Special Provisions 2020 - Updated \(07/01/2022\)](#)
-  [Memo to Current Holders](#)

### Standard Specifications 2016

-  [Standard Specifications 2016](#)
-  [Standard Items and Special Provisions 2016](#)
  -  [04-29-2019 Additions & Revisions](#)
  -  [12-28-2018 Additions & Revisions](#)
  -  [06-15-2018 Additions & Revisions](#)



# DeIDOT Standard Specifications

- Based on the 2020 Standard Specs
- Revision #2 – June 2022
- Entirely new book, no more supplementals
- Appendix A: Index of Changes
- Builds off previous revision

## Standard Specifications

for

Road and Bridge Construction

REVISION #2 - JUNE 2022



Prepared by

*The State of Delaware*



Nicole Majeski, Secretary  
Shanté A. Hastings, Chief Engineer



# DeIDOT Standard Specifications

APPENDIX A

APPENDIX A - Index of Changes

**General:** The purpose of this section is to highlight the changes that have been made within this document from the initial publication dated August 2020, and any updates after, of the standard specifications.

Section and location of change		Revision Dates	Summary of change
Division	Subsection		
<b>100</b>			
			Removed from specification and bid proposal definitions the supplemental specifications
<b>101</b>	<b>101.3</b>	JUNE 2022	Replaced Final inspection with Primary inspection
104	104.12	JUNE 2022	Replaced Final inspection with Primary inspection
104	104.15	JUNE 2022	Added section for E-construction
105	105.4.F, 105.13.D, and 105.14.A	JUNE 2022	Replaced Final inspection with Primary inspection
105	105.14.C	JUNE 2022	Added language for consistency with inspection framework
105	105.15.F.8.f and 105.15.F.8.g	JUNE 2022	Added language to clarify claim meeting
105	105.16	JUNE 2022	Replaced Final inspection with Primary inspection
<b>108</b>	<b>108.4</b>	JUNE 2022	Revised Table 108.4.1. Modified paragraph ix. Revised Table 108.4.3. Modified paragraph xii.
<b>108</b>	<b>108.7.F.4, and 108.7.F.5</b>	JUNE 2022	Revised weather day language.
<b>108</b>	<b>108.8.K</b>	JUNE 2022	Added language for consistency with inspection framework
109	109.1.M.2	JUNE 2022	Revised language regarding breakout sheet submittal
<b>200</b>			
202	202.3.3.M	JUNE 2022	Removed language for cleaning and video existing pipes.
202	202.3.5.C	JUNE 2022	Corrected the section reference.
207	207.3.B.1	JUNE 2021	Corrected the section references.
207	207.3.C.3	JUNE 2022	Revised language and added blasting requirement.



# DeIDOT Standard Construction Details

- 2022 Update
- Committee meeting held to discuss modifications and new details
- Drafting proposed changes

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DELAWARE DEPARTMENT OF TRANSPORTATION

## Standard Construction Details

The Standard Construction Details files are indexed by year and provided in Adobe Portable Document Format (pdf). Files for 2009 forward are also presented in MicroStation (dgn) format.

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THE STATE OF DELAWARE  
DEPARTMENT OF TRANSPORTATION

STANDARD CONSTRUCTION DETAILS

THIS DOCUMENT USES U.S. CUSTOMARY UNITS

06/20/2020

**ISOMETRIC**

**PLAN**

**SECTION A-A**

**SECTION B-B**

**SECTION C-C**

**SECTION D-D**

**NOTES:**

1. WHEN A GRASS STRIP IS PRESENT BETWEEN THE BACK OF CURB AND SIDEWALK, THE SIDEWALK PORTION OF THIS STRUCTURE MAY BE PRECAST. HOWEVER, WHEN THE SIDEWALK IS SITUATED BEHIND THE CURB, USE CAST-IN-PLACE CONSTRUCTION. STANDARDS FOR MORE GUIDANCE.
2. SIDEWALK WIDTHS LESS THAN SHOWN ON THIS SHEET REQUIRE DEPARTMENT APPROVAL. SEE PEDESTRIAN ACCESSIBILITY STANDARDS FOR MORE GUIDANCE.
3. OVER THE CONCRETE SPILLWAY, USE A SLAB WIDTH 12" WIDER THAN THE SIDEWALK WIDTH AND USE A 2" CONCRETE APPROX APPROACH. WHEN NOT ADJACENT TO CURB, EXTEND THE REIN AN ADDITIONAL 12" IN WIDTH TOWARD THE BACK OF THE CURB USING SAME FLARE RATES AND DIMENSIONS AS SHOWN AT THE BACK OF SIDEWALK.

**CURB / SIDEWALK OPENING**

DelDOT | 12/03/2021 | CURB / SIDEWALK OPENING | REVIEWED | 12/06/2021

RECOMMENDED | STANDARD NO. C-5 (2021) | SHT. 1 OF 1 | APPROVED | 12/01/2021

# Thank You!

John Caruano  
Support Engineer  
Division of Transportation Solutions  
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